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result. This is one difference between the *source operand* (the one unaffected by the operation) and the *destination operand* (the one overwritten by the result).

For most instructions, one of the two explicitly specified operands—either the source or the destination—can be either in a register or in memory. The other operand must be in a register or it must be an immediate source operand. This puts the explicit two-operand instructions into the following groups:

- Register to register
- Register to memory
- Memory to register
- Immediate to register
- Immediate to memory

Certain string instructions and stack manipulation instructions, however, transfer data from memory to memory. Both operands of some string instructions are in memory and are specified implicitly. Push and pop stack operations allow transfer between memory operands and the memory-based stack.

Several three-operand instructions are provided, such as the IMUL, SHRD, and SHLD instructions. Two of the three operands are specified explicitly, as for the two-operand instructions, while a third is taken from the CL register or supplied as an immediate. Other three-operand instructions, such as the string instructions when used with a repeat prefix, take all their operands from registers.

3.5.1. Immediate Operands

Certain instructions use data from the instruction itself as one (and sometimes two) of the operands. Such an operand is called an *immediate* operand. It can be a byte, word, or doubleword. For example:

SHR PATTERN, 2

One byte of the instruction holds the value 2, the number of bits by which to shift the variable PATTERN.

TEST PATTERN, 0FFFF00FFH

A doubleword of the instruction holds the mask which is used to test the variable PATTERN.

IMUL CX, MEMWORD, 3

A word in memory is multiplied by an immediate 3 and stored into the CX register.

All arithmetic instructions (except divide) allow the source operand to be an immediate value. When the destination is the EAX or AL register, the instruction encoding is one byte shorter than with the other general registers.